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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/524,411	05/26/2005	Stephen Gerard Cobbe	1377-0199PUS1	4566

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BIRCH STEWART KOLASCH & BIRCH
PO BOX 747
FALLS CHURCH, VA 22040-0747

EXAMINER
JOHNSON, KEVIN M

ART UNIT	PAPER NUMBER
1793	

NOTIFICATION DATE	DELIVERY MODE
11/17/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary	Application No.	Applicant(s)	
	10/524,411	COBBE ET AL.	
	Examiner	Art Unit	
	KEVIN M. JOHNSON	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 July 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-9,12,14-18 and 21-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9, 12, 14-18 and 21-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status

1. Claims 14 and 16 have been amended. Claims 10, 11, 13, 19-20 and 24-32 have been cancelled. Claims 1-9, 12, 14-18 and 21-23 are pending and presented for examination.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1, 2, 12 and 14-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawata et al. (US 6696113).

In regard to claims 1-2, Kawata teaches a method of producing gold nano-rods comprising the steps of:

Preparing a porous alumina by anodizing aluminum

Precipitating copper on to the porous alumina

Precipitating gold on to the copper to form rod-like gold grains

Removing the gold grains from the pores by dissolving the alumina

Although, Kawata does not specifically disclose the permeation of the coating material into the pores of the porous membrane or that the coating material flows relative to the microparticles, it would have been obvious to one of ordinary skill in the art at the time of the invention that the liquid coating material could permeate the pores of the alumina and that the coating material must flow relative to the microparticles during the coating process for the particles to be exposed to the coating solution.

In regard to claim 12, it is well known in the art that high porosity alumina membranes with a hexagonal pore structure are commercially available, and could be used in place of the anodized porous alumina substrate in Kawata, as it would simplify the production process.

In regard to claim 14, one skilled in the art would have found it obvious at the time of the invention that the excess coating solution would necessarily pass through

the pores of the membrane. Additionally, one skilled in the art at the time of the invention would find it obvious that a particle on the surface of the porous membrane taught by Kawata would contact the coating material before the coating material entered the pores of the membrane.

In regard to claims 15 and 16, it would have been obvious to one skilled in the art at the time of the invention that for flow of the coating material to occur a differential pressure must have been applied to the coating material thereby to the porous alumina membrane. It would have further been obvious to select a flow rate of 1.5 cm^3/min for the coating material in the course of routine optimization. This would have been motivated by the teaching of Kawata that amount of time the coating is in contact with the particles is proportional to the amount of coating deposited (column 16, line 27-29), and the understanding that by adjusting the flow rate the amount of time the coating material and particles are in contact could be adjusted.

In regard to claims 17 and 18, it would have been obvious to one skilled in the art that in the process taught by Kawata the coating material would pass through the pore before contacting the particles. This would be the case when the particles are at the bottom of the pores, as the coating material must pass through the pore aperture before contacting the particles. It would also be obvious to one skilled in the art at the time of the invention that the process as disclosed by Kawata would take place under the influence of gravity, and that gravity could facilitate the flow of the coating material.

6. Claims 3-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawata as applied to claims 1 and 2 above, and further in view of Petit et al. (Materials Letters, Vol. 51, pp.478-484).

In regard to claims 3-5, while Kawata fails to teach the use of nanospheres, microparticles of silica or latex or chemically modifying the surface of the microparticles Petit teaches spherical silica nanoparticles that are amine functionalized to increase the affinity of gold for the particle surface, and then coating one hemisphere of the particles with gold (p 481, column 2). It would have been obvious to produce the particles taught by Petit with the process taught by Kawata because as taught by Petit (p 481, column 2) gold has an affinity for amine functionalized silica, and therefore the amine functionalized silica particles of Petit could be substituted for the copper particles of Kawata.

In regard to claims 6-9, Petit teaches the use of citrate stabilized gold nanoparticles to coat the surface of the silica particles (p479, section 2.3).

7. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kawata as applied to claim 17 above, and further in view of Fain wt al. (US 6649255).

In regard to claim 21, Fain teaches an extremely small pore inorganic membrane, with mean pore diameters of less than 20 angstroms. It would be obvious to one skilled in the art that pores of this size would be smaller than particles which would be immobilized on the membrane as taught by Kawata. The substitution of the membranes taught by Fain would occur in the course of routine optimization of the process taught by Kawata, in an effort to refine the produced particle geometries.

8. Claims 22-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawata as applied to claim 1 above, and further in view of Takei et al. (Langmuir, Vol. 13, No. 7, pp. 1866-1868).

In regard to claim 22, Kawata fails to teach the use of a bi-functional molecule to ensure that multiple coating layers can be applied to the particles. Takei modifies the gold coating by attaching thioglycholate (TG) or 2-aminoethanethiol (2-AET) to the gold surface and then attaching the non-selected thiol to the chemisorbed thiol, this allowed the further adsorption of additional gold particles (p1866, column 2). The combination of the thiols results in a bi-functional molecule that selectively adheres to the gold coating material. Such a modification would have been obvious to one skilled in the art at the time of the invention as a way to increase the amount of gold coated on to the particles taught by Kawata.

In regard to claim 23, Takei teaches the removal of patterned microparticles from the substrate by sonication (p 1866, column 1).

Response to Arguments

9. Applicant's arguments filed 7/22/2008 have been fully considered but they are not persuasive.

The argument that Kawata does not teach the claimed deposition process is not persuasive. While Kawata does not expressly state that the gold binds to the copper, it is taught that the dissolution of the copper results in the separation of the gold from the film. One skilled in the art would understand that that for the dissolution of the copper to

result in the separation of the gold from the film the gold must be bound to the copper, otherwise the dissolution of the copper would not have any effect on the gold.

The argument that the entire membrane in the instant invention must be porous is not convincing. The claims only require that the pores of the membrane are permeated, there are no requirements placed on the way in which the pores are permeated. In the process taught by Kawata the pores of the membrane are indeed permeated.

The argument that the coating material does not permeate the pores of the membrane is not convincing. First, it should be noted that the language "can permeate through the pores of said membrane" does not require that the material actually permeates the pores, merely that it is capable of doing so. Additionally, one skilled in the art at the time of the invention would realize that the coating material would necessarily enter the pores of the membrane in the process taught by Kawata.

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KEVIN M. JOHNSON whose telephone number is (571)270-3584. The examiner can normally be reached on Monday-Friday 7:30 AM to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry Lorengo can be reached on 571-272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J.A. LORENGO/
Supervisory Patent Examiner, Art Unit 1793

/Kevin M Johnson/
Examiner, Art Unit 1793